

10-20-19

# Breidert Air-X-Hauster

THE GREATEST SCIENTIFIC IMPROVEMENT IN ROOF VENTILATORS IN MORE THAN 50 YEARS



PATENT NO. 2269428

**PARENT  
AND  
KIRKBRIDE**  
HEATING  
VENTILATING  
AIR CONDITIONING  
EQUIPMENT  
FOURTH ST. AT LOCUST  
PHILADELPHIA, PA.

*Specifications*

## ENGINEERING DATA

No. 44-1

G. C. BREIDERT CO.

634 SO. SPRING ST., LOS ANGELES 14, CALIF.

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AIA File No. 30D1

BREIDERT AIR-X-HAUSTER

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*George C. Breidert, inventor and manufacturer of the Breidert Air-X-Hauster*

IN THE FEW YEARS that have elapsed since the Breidert Air-X-Hauster was first put on the market, its revolutionary design and remarkable success have led many ventilating experts and builders to ask "Who is Breidert?"

George C. Breidert is a successful ventilating engineer and inventor who has had more than 35 years of practical experience in the ventilating field. He invented the ventilators used extensively on railway cars before the advent of air conditioning. Many of his revolutionary ideas on ventilation are now accepted as standard by the entire industry. He has patented various types of ventilators, many of which are in use all over the world.

It was Mr. Breidert's greatest ambition to design a roof ventilator with greater all-around efficiency and more pleasing architectural lines than conventional ventilators possess. Utilizing proven principles of aerodynamics, Mr. Breidert perfected the radically different Breidert Air-X-Hauster, his most important invention. *It is the greatest scientific improvement in roof ventilators in more than fifty years.* Complete facts about the Breidert Air-X-Hauster and its various types are given on the following pages.

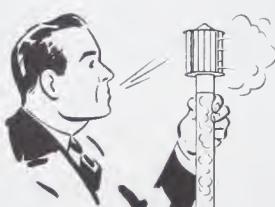
## THE BREIDERT AIR-X-HAUSTER

### The Greatest Scientific Improvement in Ventilators in more than Fifty Years!

**Principle of Operation.** The design of the Breidert Air-X-Hauster is completely unlike that of any other ventilator now on the market. Most conventional ventilators work effectively only when the wind strikes on a horizontal plane. Wind currents coming from other angles, which is often the case, cause annoying down-drafts and stagnation of stale air in the ventilator. The design of the Breidert Air-X-Hauster, however, is based on modern science's knowledge of aerodynamics. This revolutionary ventilator utilizes outside air currents to achieve *positive ventilation under all conditions*.

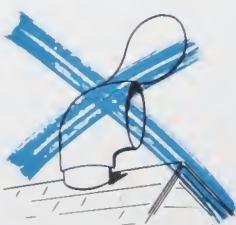
#### Uses One of Nature's Laws.

**Laws.** Air always rushes in to fill a vacuum. Wind currents striking the Breidert Air-X-Hauster create a vacuum, which causes stale air to be sucked out as in the demonstration illustrated at right.



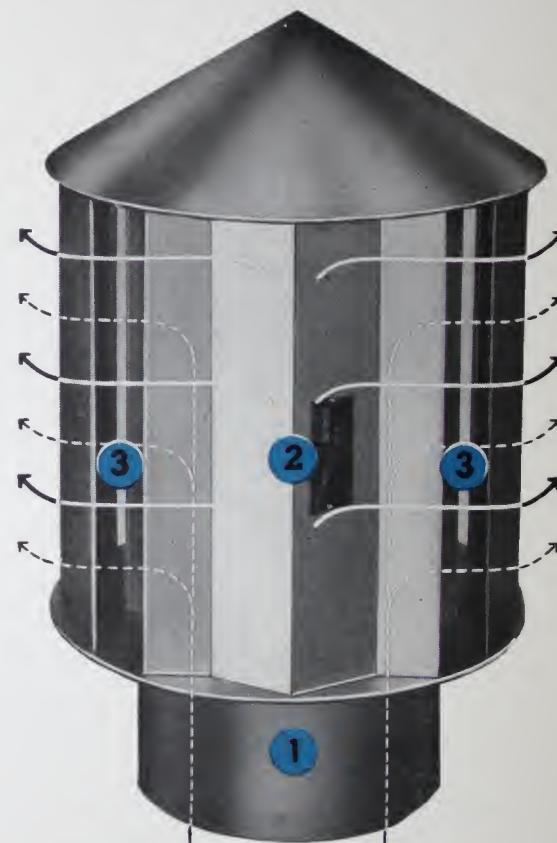
#### Stationary . . . No Moving Parts.

**Stationary . . . No Moving Parts.** The Breidert Air-X-Hauster remains absolutely stationary . . . requires no fans in ordinary cases. There are no moving parts to jam or get out of order, yet it attains standards of ventilating efficiency never approached by conventional ventilators.



#### No More Back-Drafts.

Due to an ingenious inner baffle construction, it is impossible for the positive suction action of the Breidert Air-X-Hauster to be reversed. *Back-drafts are eliminated where no negative pressure prevails.* The Breidert Air-X-Hauster overcomes many back-draft difficulties where other ventilators fail.



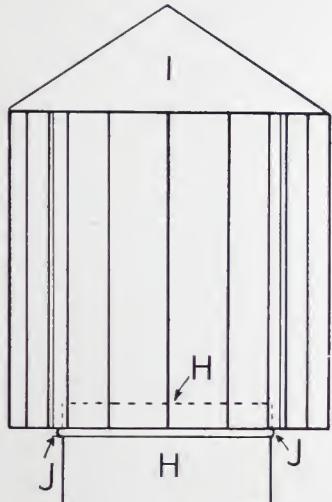
1. Ventilator neck, connected by collar to ventilating pipe.
2. Outside walls of ventilator. V-shaped faces deflect wind (solid white lines) past openings, 3, creating siphon which exhausts stale air (dotted lines).
3. Air outlet openings at four corners of the ventilator. Note in drawings on opposite page the ingenious baffle arrangement inside the openings, which prevents back-drafts.

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### No Matter Which Way The Wind Blows . . .

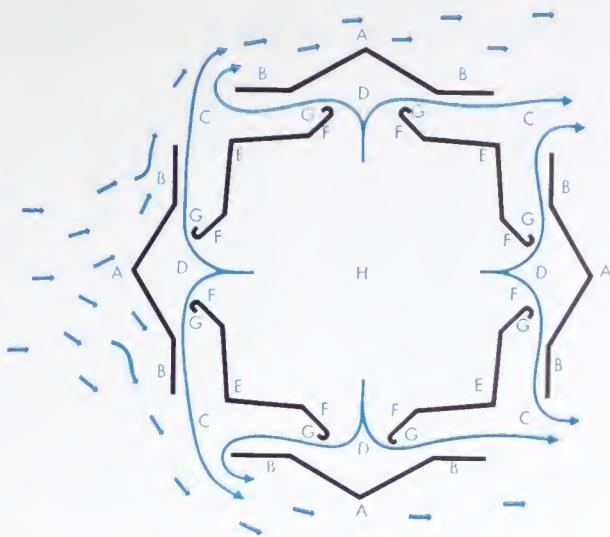
The aerodynamically correct principle of the Breidert Air-X-Hauster causes it to operate effectively, under either of the conditions shown at right.

*In either case, air is siphoned out of the building or vehicle on which the ventilator is installed. The Breidert Air-X-Hauster is adaptable to all types of structures, including many on which roof ventilators were never before considered practical. See applications on following pages.*



#### Key to Letters Shown in Diagrams

- (A) — V-shaped wind dividing face on four sides.
- (B) — Transverse flat wind-resisting face.
- (C) — Vertical openings on four corners where strong siphon is created, drawing air up through neck (H).
- (D) — Inside vertical openings through which air is siphoned from neck (H).
- (E) — Inside deflector walls.
- (F) — Inside deflectors and rain stops prevent rain from entering through openings (D).
- (G) — Rain arrestors.
- (H) — Round neck connected with inside of room or building through which air rises. Neck extends above floor or bottom of ventilator. Rain drains outside of neck at (J).
- (I) — Cone on top of ventilator deflects down currents of air over openings (C).



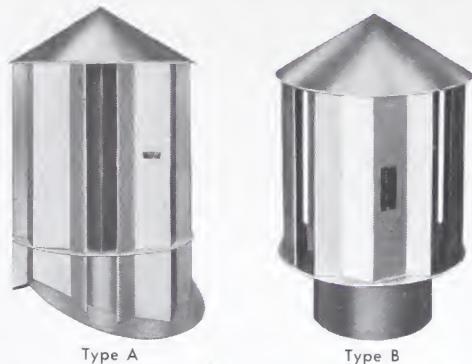
**Condition No. 1:** Wind strikes V-shaped face (A) of Breidert Air-X-Hauster and is deflected away and across outlet openings (C) at high velocity. A venturi action is caused which induces a secondary air motion through ventilator and out openings (C). The velocity of secondary air motion through the ventilator is in a much higher ratio to wind currents against outside surfaces than with conventional stationary types, regardless of wind direction.



**Condition No. 2:** Wind strikes directly at outlet opening (C). Some wind is deflected past openings, causing siphon through inner openings (D). Wind entering directly into outlet opening is deflected past inner openings by baffles (E) causing siphon action, and passes out through other outer openings (C).

# THE BREIDERT AIR-X-HAUSTER

## More Pleasing in Appearance



Type A

Type B

### Determining size and number of ventilators needed for given rate of air change

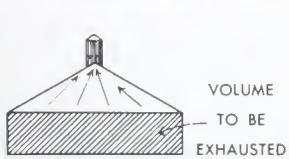


Figure 1

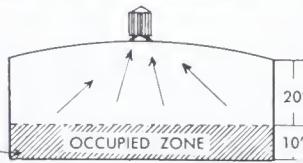


Figure 2

The standard of ventilation is based on the length of time required to exhaust the entire volume of air in a room or building. For example, assume a five minute air change is desired. Determine the cubic content of the space by multiplying the length by the width by the height; i.e., in a room 30 x 60 x 12 feet, the cubic content is 21,600 cubic feet. By dividing this content by 5, it is found that 4320 cubic feet of air per minute must be exhausted to change the air every five minutes. By referring to the ventilator capacity tables on pages 18, 19 and 20, the proper size and number of ventilators can be selected.

In rooms with high ceilings it is not necessary to figure on changing the entire volume of air, but only that to a height of ten feet above the floor, because this is the occupied zone and space above it need not be considered. Thus, in a room thirty feet high a fifteen minute change in the entire space is equal to a five minute change in the occupied zone as indicated in Figure 2 above. This calculation will be satisfactory only if the ventilator is mounted well above the ten foot zone and fresh air is admitted low in this zone.

The rate of air change required in various types of buildings according to accepted standards is given below.

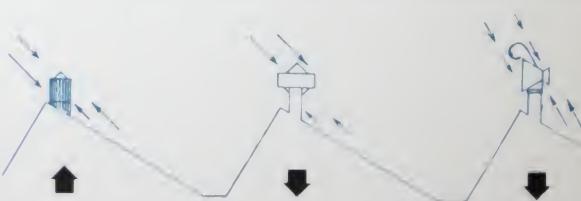
Restaurant and Hotel Kitchens	2 Min.
Residence Kitchens	2-3 Min.
Offices, depending on density of occupancy	5-10 Min.
Factory Buildings	5-10 Min.
Night cooling by attic ventilation	2 Min. on floor below
Garages (Repair Shops)	4-6 Min.
Theatres, Lodges, Assembly Halls	3-4 Min.
Laundries	3-6 Min.
Farm Barns	30 CFM* per horse
Stores	60* CFM per cow
*Cubic feet per minute.	5 Min.

The Breidert Air-X-Hauster has been praised by many architects and builders for its compact and attractive appearance, with no unsightly mountings. The Type A is especially recommended for homes and buildings where the most pleasing appearance is desired. The base of the ventilator is hidden from view by the outer walls extending down to the roof. The wind resisting surface which is so important to the proper functioning of the ventilator is thus increased and appearance is also improved.

The Type B has the same construction as the Type A, except that the outer walls do not extend to the roof and the base is exposed to view. This base is not furnished as part of the Type B ventilator, but must be ordered separately.

## Higher Efficiency

The Breidert Air-X-Hauster fulfills the long-felt need for a means of moving large quantities of air at small cost from spaces or rooms directly under the roof or where it is possible to run vertical ducts to lower floors of multi-storyed buildings. Confidence in the merits of the old-fashioned round type of roof ventilator (more commonly known as a "globe ventilator," which has been imitated and redesigned for many years) has steadily diminished. Architects and engineers have long known that certain types of ventilators are unsatisfactory because of annoying "down-drafts" (back-draft or reversed action) which defeat the purpose of the ventilator. Proper ventilation depends entirely on the movement of adequate volumes of air in a predetermined manner. That is, if a 10 minute



Above is shown the appearance and characteristic action of the Breidert Air-X-Hauster (left) compared to conventional round and revolving type ventilators, each set on the ridge of a saw tooth roof. Up or down air currents, indicated by arrows, do not affect the positive siphon action of the Breidert Air-X-Hauster. The round and revolving type ventilators "back up" and cause down-drafts under the same wind conditions, as shown by heavy arrows.

## THE BREIDERT AIR-X-HAUSTER

air change is desired, there should be no fluctuation due to a down-draft of air in the ventilator reversing the circulation and upsetting the air change.

The Breidert Air-X-Hauster is absolutely positive in action. When properly installed, you can use fewer and smaller Breidert Air-X-Hausters than conventional venti-

lators because of their higher efficiency. With no operating expense, they move amazingly large volumes of air. There are no fluctuations due to down-drafts or stagnation of air in the ventilator. Breidert Air-X-Hausters are also highly effective when used for night cooling by attic ventilation.

### Installations on Industrial Buildings

Proper ventilation of industrial buildings is one of the most important and at the same time most neglected phases of the ventilating problem. An adequate supply of fresh air is necessary in all shops where there are a number of employees and especially where the manufacturing processes produce quantities of heat, dust or noxious fumes. The moving of such an amount of air often is costly by mechanical means and thus ventilation of such areas is frequently neglected. The use of Breidert Air-X-Hausters provides a means of moving a large volume of air with a low initial cost and no operating expense.

Figure 1 shows the application of Type A Breidert Air-X-Hausters on a saw tooth type roof. Note how the base is hidden from view. Figure 2 shows an application of a Type B Breidert Air-X-Hauster on a monitor type roof.

Ventilators should always be installed at the highest point of the roof. With the correct number for adequate ventilation thus installed it is essential to keep the saw tooth or monitor windows closed to keep the air from short circuiting. This has a further special advantage during inclement weather, when open windows would cause cold down-drafts and permit entrance of snow and rain. Closed saw tooth windows also keep out smoke and fumes from adjacent buildings.

Breidert Air-X-Hausters installed in the above manner will prevent condensation of moisture on the saw tooth windows, when it is cold outside and the inside air is warm and moist, by constantly exhausting this moisture to the outside instead of allowing it to collect on the cold windows.

A great variety of applications of Breidert Air-X-

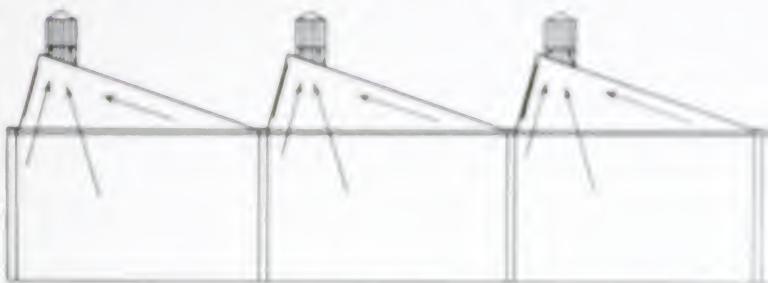


Figure 1

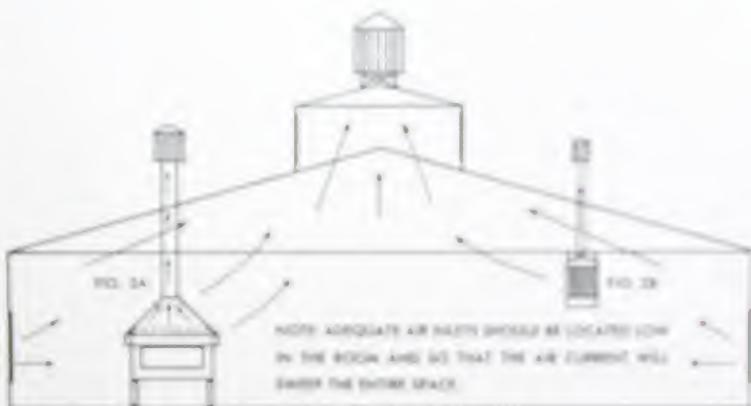


Figure 2

Hausters can be made in industrial plants to take care of special requirements for ventilation due to processes used or of particular sections which require separate treatment, such as offices, store rooms, locker rooms, wash and dressing rooms, etc. Where hoods are used over ovens, oaks, etc., Breidert Air-X-Hausters can be installed on stacks to increase the air movement (Note Figure 2A). Due to their "no back-draft" feature, Breidert Air-X-Hausters are especially adapted for use on "frost lines" from gas or oil burners to prevent pilot lights from blowing out (Note Figure 2B).

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### Installations on Commercial and Public Buildings

**Figure 1 . . .** Sectional view of a flat roof building showing how Breidert Air-X-Hausters may be installed to reduce the temperature in the attic space and create a very effective circulation of air. Breidert Air-X-Hausters do not "back up" and carry in odors from adjoining buildings or force the heat of the attic space down into the rooms below. Ordinary louvre ventilators in side walls fail to create a circulation or ventilate the space below the attic.

During summer months, with Breidert Air-X-Hausters installed on the roof, the cool night air is drawn through the building without the use of fans or motors. The entire building is thus pre-cooled during the night. By insulating the attic floor, the pre-cooling effect is conserved through the heat of the next day. This combination of positive ventilation with attic floor insulation will give appreciable relief to those who cannot afford a more elaborate system.

**Figure 2 . . .** Cross section of an arch roof building. A number of Breidert Air-X-Hausters installed on the roof along the center of the building will exhaust the heat and foul air very effectively. The Type A Breidert Air-X-Hauster with weather vanes removes the bareness of the roof line. To get best results ventilators should be installed at the highest point of the roof.

**Figure 3 . . .** Typical installation of Type A Breidert Air-X-Hauster on a church. The hot air is exhausted out of the attic space in the same manner as shown in Figure 1, above. This provides a double benefit, by removing the blanket of hot air from the attic and by creating a positive air movement throughout the room as indicated by arrows. The room can also be pre-cooled before services by keeping air inlets open at night to draw the cool night air through the building to absorb the heat stored up in the walls and furnishings.

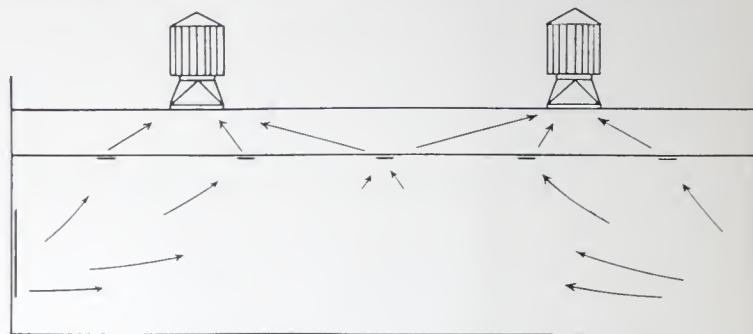


Figure 1

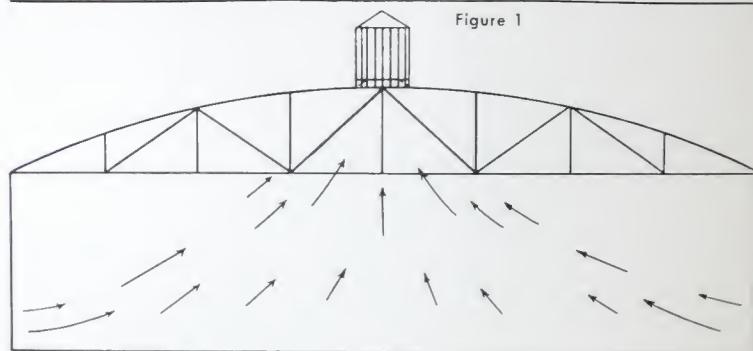


Figure 2

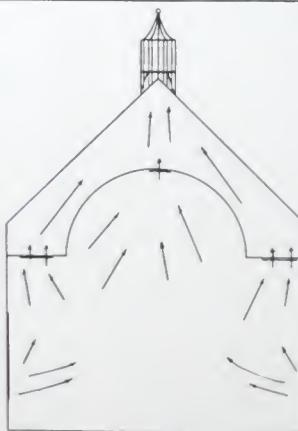


Figure 3

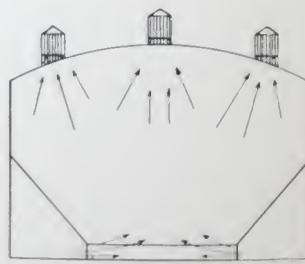


Figure 4

**Figure 4 . . .** Breidert Air-X-Hausters can be installed on the roof of gymnasiums, arenas and such buildings as shown to create an upward air movement through all parts of the room. Where heavy smoke prevails as in an arena, it is essential to provide sufficient ventilators to carry off the smoke rapidly. With ventilators installed on the highest point of the roof, and fresh air admitted near the floor line, a circulation as indicated with arrows will quickly carry the smoke and foul air above the occupied zone.

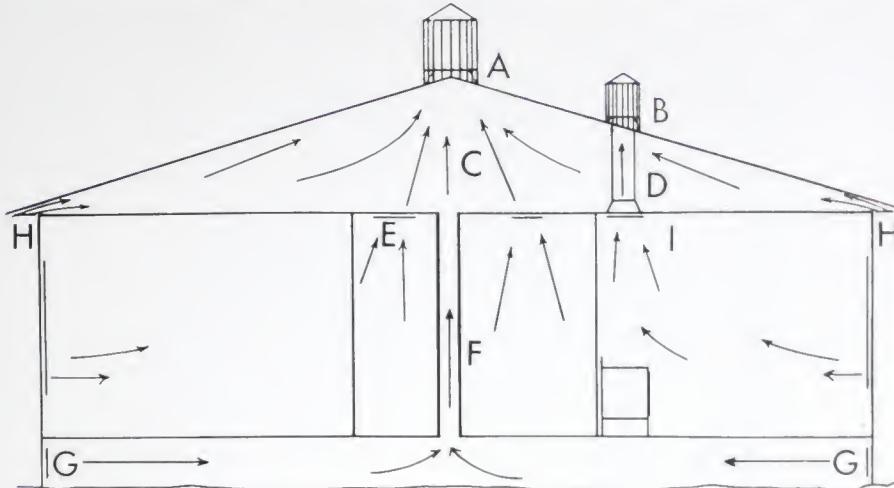
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### Installations for Residence Cooling and Ventilation

At right is shown a Breidert Air-X-Hauster (Type A) installed on the ridge of a gable-roofed residence. In ordinary construction, with no ventilation, the attic temperature in such a house will often reach 120° to 130° with only 90° outdoors. By installing one or more Type A Breidert Air-X-Hauster, the hot air in the attic space (C) is exhausted as indicated by arrows. Register openings should be placed in the ceiling of clothes closets, hallways and bathrooms, as shown at (E). Additional screened openings (1/4" mesh) placed under the eave at (H) will facilitate the circulation in the attic as shown. This method of attic cooling in conjunction with insulation as mentioned on page 6 produces very effective results, particularly since the cool night air can be circulated throughout the entire house thereby pre-cooling the building for the following day.

Architects and engineers will find this method of attic cooling practical in connection with the air conditioning systems for residences, commercial buildings and offices. It reduces the load on the compressor considerably. Heat loss can be checked in winter by simply closing the registers. The screened openings at (H) likewise may be closed if desired. This system is scientifically correct and costs little more than metal dormers or louvre ventilators which are not effective.

Kitchen ventilation is now a recognized necessity. The simple yet effective system shown at (B) and (D) above is rapidly becoming popular. First, because there is no operating or maintenance cost. Second, there is no noise. Silently, night and day, a pleasing circulation of air removes every trace of cooking odors. A Breidert Air-X-Hauster (Type A) installed on the side slope of the roof, as illustrated at (B), with a vertical duct (D) down to a grill in the ceiling directly over the range, exhausts the heat and grease odors at their source (note circulation shown by arrows). Walls and decorations are protected from films of grease and accumulation of dust. This saving



alone warrants the expense. A transition from the register (closing type) shown at (I) connects with vertical duct (D).

The following sizes of ventilators and registers are recommended for one story residence and bungalow kitchens in the manner shown at (B) and (D).

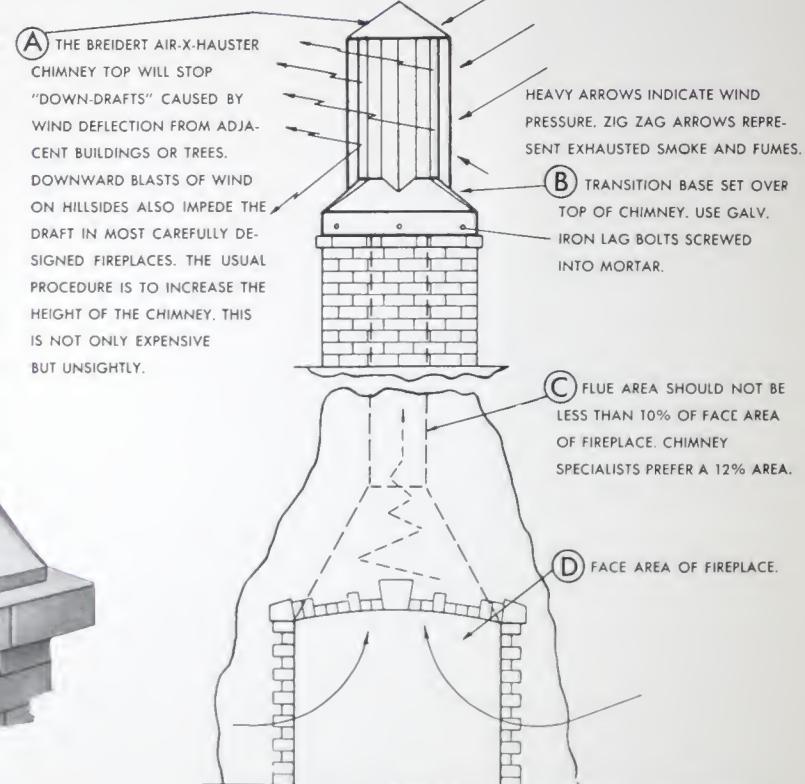
12" size for kitchens with 750 to 1000 cubic feet	Use 14" x 14" Louvre Registers
10" size for kitchens with 500 to 750 cubic feet	Use 12" x 12" Louvre Registers
8" size for kitchens with 500 cubic feet or less	Use 10" x 10" Louvre Registers

### Termite Control

Termite control experts agree that the space below the first floor and above the ground should be kept dry and well ventilated. A simple and effective system of ventilation is shown at (F). One or more vertical ducts extending from the basement (can be located in clothes closets) as illustrated will exhaust the air from the space under the first floor, into the attic and out through the ventilator on the ridge. Fresh air is automatically drawn in through side wall louvres (screened) as shown at (G). It is now compulsory in certain building codes to install such inlet openings as shown. Much greater effect is obtained by the addition of vertical ducts to a ventilated attic as described.

## THE BREIDERT AIR-X-HAUSTER

### Breidert Air-X-Hauster for Chimney Top



In many parts of the country fireplace chimneys and incinerator, gas boiler or furnace stacks become sluggish and subject to back-draft due to adverse high winds deflected downward from tall trees, adjacent buildings and hillsides. This is particularly true where residences are on hillsides or in mountain canyons. Smoky fireplaces make the room uninhabitable and damage decorations.

The drawing above shows the proper application of a Breidert Air-X-Hauster on a fireplace chimney. Contributing causes for sluggish flue action are (a) obstructions and heavy accumulation of soot in the flue (b) lack of air supply to the fire. Chimneys will not draw if the room or building has no source of air supply. A window (or special air inlet) should be slightly opened elsewhere in the house to admit air to relieve the vacuum caused by the ventilator. Excessive smoke is caused by accumulation

of ashes. A fire grate creates better fuel combustion and should be used, as a fire burns more freely if air is drawn in under the grate.

The size of the ventilator required is governed by the size of the flue. Note (C) in drawing. The area of the ventilator neck should be equal to, or slightly larger than the area of the flue. On double flue chimneys a single ventilator can be used. Simply figure the combined area of both flues and select a ventilator with the same total area. See page 13 for areas, etc.

Breidert Air-X-Hausters for Chimney Tops are made in sizes 8, 9, 10, 12, 14 and 16-inch, with bases to fit chimney. Dimensions are the same as the Type B-2 Breidert Air-X-Hauster (see pages 12, 13). All Chimney Tops are made of 20-gauge galvanized steel. Bases are not included as part of Chimney Tops.

## THE BREIDERT AIR-X-HAUSTER

### Breidert Air-X-Hauster Vent Flue Caps



Although there has been a great advance in combustion efficiency, too little thought is given to down-drafts in flues caused by adverse outside wind.

The most efficient heaters—using oil, gas or any other fuel—often perform quite differently in the field than in factory laboratories. This is generally due to varying wind conditions and downward wind pressure caused by adjacent high buildings, trees or hilly country. Our attention has been called to many high grade heaters which in one section performed in a most efficient manner, while in another it was difficult to keep pilot lights burning. In such cases, the first step is usually to turn up the pilot light which means greater gas consumption. This is a dangerous procedure in the event the pilot light is blown out, as the unburned gas will not rise upward into the flue if the draft is unsteady due to frequent down-drafts.

There is one safe solution—namely, a Breidert Air-X-Hauster, which induces a draft when the wind blows instead of choking the flue and causing a down-draft. Many severe tests have been made with the Breidert Air-X-Hauster ventilator in which it proved vastly superior to other vent flue caps in creating a suction and preventing back-drafts. It is more compact and neater in appearance.

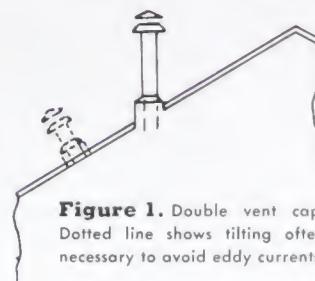
Vent flue cap sizes and dimensions are shown on pages 12 and 13.

The drawings on this page show the relative appearance of various types of vent flue caps of equal size as used in different parts of the country. The most commonly used heretofore is the plain double vent cap, Figure 1, and the "A" shaped vent, Figure 2. Both of these must be set high above a roof or parapet wall in order to avoid eddy currents caused by wind deflected from adjacent buildings, etc. In an identical application the Breidert Air-X-Hauster need not be set so high. In fact, it can be set next to a pitched roof as shown in Figure 3.

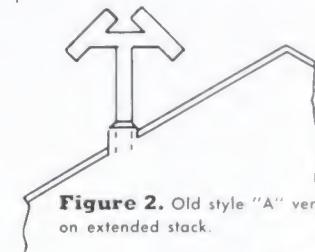
Heretofore it has been a practice to use individual flues for each heater on gas unit heaters, floor or wall types. This applies to residence heaters in territories where gas heat is commonly used. It is now practical to run several vent flues to one large Breidert Air-X-Hauster centrally located, as shown in Figure 4. This combines all vent outlets into one, thus eliminating the unsightly appearance of so many vent caps on a roof, and also saving on the cost. The area of the ventilator neck should equal the combined area of the flues leading into it.

Figure 5 illustrates another novel application. Here is shown a simple method of running one or more vent flues to a larger size Breidert Air-X-Hauster on the ridge with the balance of the ventilator neck left open to exhaust the attic heat. This is similar to the system shown on page 7 pertaining to residence cooling with night air.

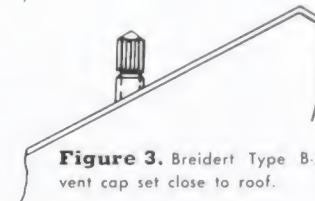
NOTE: Ordinances in some cities covering vent flue applications were enacted prior to the development of the Breidert Air-X-Hauster. It may be necessary to secure the approval of your local building commission before making installations.



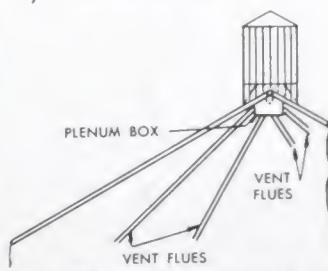
**Figure 1.** Double vent cap. Dotted line shows tilting often necessary to avoid eddy currents.



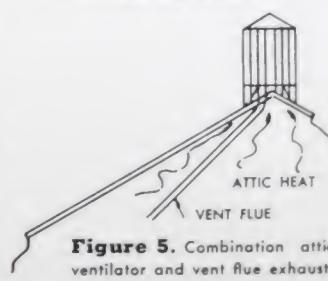
**Figure 2.** Old style "A" vent on extended stack.



**Figure 3.** Breidert Type B-2 vent cap set close to roof.



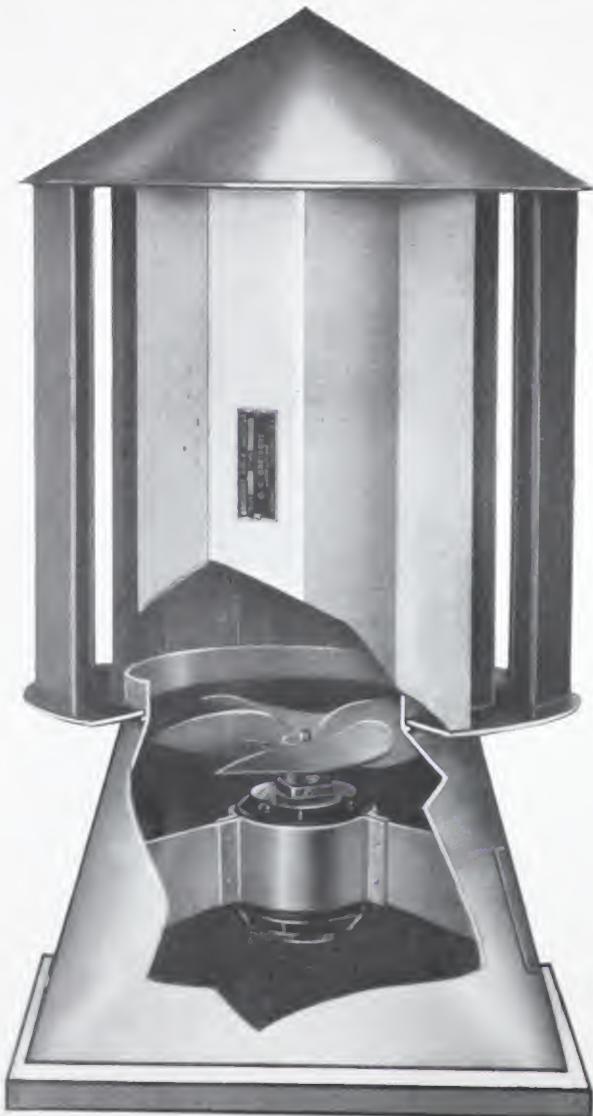
**Figure 4.** Larger size Breidert Air-X-Hauster handling a series of flues. Plenum box can be insulated with asbestos.



**Figure 5.** Combination attic ventilator and vent flue exhaust.

## THE BREIDERT AIR-X-HAUSTER

### Breidert Air-X-Hauster Motor and Fan Assemblies



Type MFS motor and fan assemblies can be installed in existing ventilators. Or this type ventilator can be built for a motor and fan assembly but erected less the assembly, which can be installed later. Write for further information.

When greater capacity is required on any ventilator installation than normal wind velocity will give, Breidert Air-X-Hausters can be equipped with motor driven fans. These fans are mounted in the base below the neck of the ventilator. The fan blade is the full diameter of the ventilator neck. The flare of the base gives clearance around the fan blades and compensates for the space occupied by the motor and fan blades. Thus the full capacity of the ventilator is retained when operating under natural draft only. This type of Breidert Air-X-Hauster is furnished only with the fan mounted in the base, which becomes part of the ventilator. See curb construction on next page.

With the wind blowing across the ventilator head at the same time the fan is operating, the output is increased by the natural suction of the ventilator in proportion to the wind velocity. This is the opposite effect to that of wind on an ordinary ventilating fan where the wind tends to reduce the capacity rather than to increase it. This makes the Breidert Air-X-Hauster, equipped with motor and fan, much more efficient than the ordinary type of exhaust fan installed in a penthouse. Such a Breidert Air-X-Hauster installation continues to act as a natural draft ventilator with full capacity during the night time or when the fan is not running. A fan in a penthouse has no appreciable action of this kind. A space equipped with such Breidert Air-X-Hausters will therefore be thoroughly ventilated and cooled by the circulation of night air through it.

### Breidert Fan Type MFS

In the Type MFS Breidert Air-X-Hauster (left), the fan blade is mounted on the motor shaft up to and including the 24-inch size and the assembly is supported on a suspension bracket below the neck of the ventilator. On the 30-inch and larger sizes the fan is driven by a V belt and the motor is mounted to one side. Provision is made for oiling these assemblies from outside the ventilator when necessary. Access to the motor is through the neck of the ventilator when the installation is such that this opening is within reach. If not accessible in this manner, the entire ventilator head, up to the 16-inch size on the Type MFS, can be lifted off. On larger sizes a weather-proof access door is provided in the base.

## THE BREIDERT AIR-X-HAUSTER



### Breidert Fan Type MC

In the Type MC Breidert Air-X-Hauster (left), the fan blade is mounted in the base in the same location as in Type MFS, but the shaft is extended upward through the center of the ventilator. The motor is mounted inside of the conical top of the ventilator directly connected to the extended shaft on sizes up to and including the 24-inch. On 30-inch and larger sizes the motor is offset and the fan shaft is driven by a V belt.

On this type there is a solid top to the ventilator body which completely separates the motor compartment from the exhaust air passage. This motor space is well ventilated by outside air through a slot at the bottom edge completely around the cone.

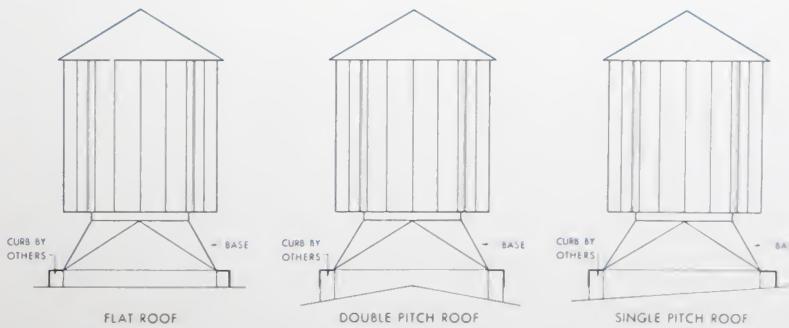
The Type MC has a great advantage over the Type MFS in that the motor is out of the path of the exhaust air. It is therefore protected against dust, moisture, fumes, excessive heat, etc., which may be present in the exhaust. It operates in a space well ventilated by circulation caused by wind pressure on the outside.

On the Type MC Breidert Air-X-Hauster, access to the motor is had by removing the top cone on sizes up to 20 inches. On larger sizes an access door is provided in the cone. The lower fan shaft bearing is lubricated through a tube leading from the bearing to a fitting on the outside of the base.

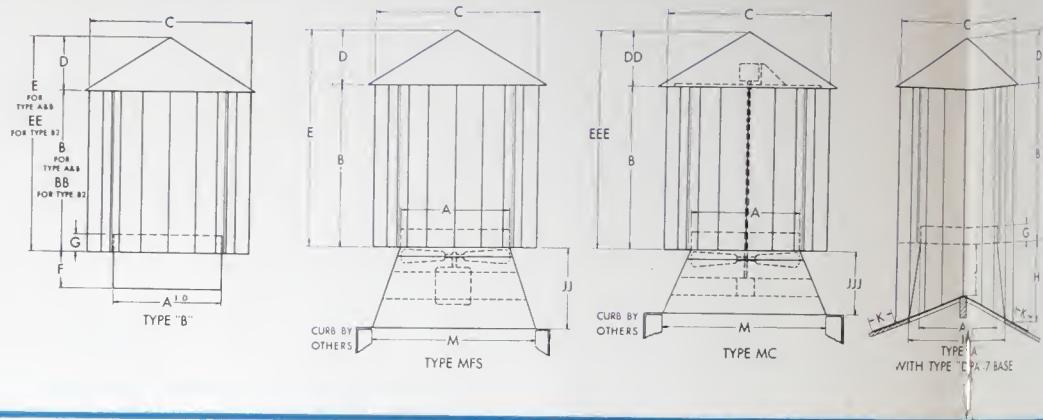
Types MFS and MC can be used in any of the applications for Type A or Type B ventilators described elsewhere in this book. Type MFS motor and fan assemblies can be applied to existing ventilators if desired.

### Curb Construction

Types MFS and MC assemblies are supplied in FR4 bases only. Diagrams show how curbs should be constructed by customer on various types of roofs to fit the FR4 base.



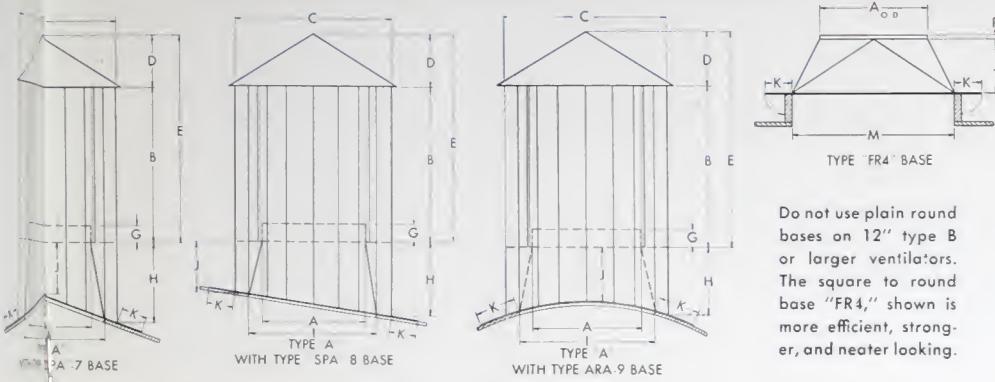
# Construction Details of the Brei



## Overall Dimensions

SIZE OF VENT	ACCORDING TO PITCH OF ROOF														DD	
	A	B	BB	C	D	E	EE	F	G	H	I(DIAM.)	J	K	M	P	
4	4"	6"	8"	6"	2"	8"	10"	2"	1"							
5	5"	7½"	10"	7½"	2½"	10"	12½"	2"	1"							
6	6"	9"	12"	9"	3"	12"	15"	2"	1"							
7	7"	10½"	14"	10½"	3½"	14"	17½"	2½"	1¼"							
8	8"	12"	16"	12"	4"	16"	20"	2½"	1½"	10"	4"	6"				
9	9"	13½"	18"	13"	4½"	18"	22½"	3"	1½"	11¼"	4½"	6"				
10	10"	15"	20"	15"	5"	20"	25"	3½"	2"	12½"	5"	6"				
12	12"	18"	24"	18"	6"	24"	30"	4"	2"	15"	6"	6"	18"	3"	11	
14	14"	21"		21"	7"	28"		4½"	2¼"	17½"	7"	6"	21"	3"	13	
16	16"	24"		24"	8"	32"		5½"	2½"	20"	8"	6"	24"	3"	14	
18	18"	27"		27"	9"	36"		6"	3"	22½"	9"	6"	27"	3"	16	
20	20"	30"		30"	10"	40"		6½"	3½"	25"	10"	6"	30"	3"	17	
22	22"	33"		33"	11"	44"		7"	3½"	27½"	11"	6"	33"	3"	20	
24	24"	36"		36"	12"	48"		8"	4"	30"	12"	6"	36"	3"	23	
26	26"	39"		39"	13"	52"		8"	4¼"	32½"	13"	6"	39"	3"	26	
28	28"	42"		42"	14"	56"		9"	4½"	35"	14"	6"	42"	3"	28	
30	30"	45"		45"	15"	60"		10"	5"	37½"	15"	8"	45"	4"	30	
36	36"	54"		54"	18"	72"		12"	6"	45"	18"	10"	54"	4"	36	
42	42"	63"		63"	21"	84"		14"	7"	52½"	21"	12"	63"	4"	35	
48	48"	72"		72"	24"	96"		18"	8"	60"	24"	12"	72"	4"	39	

# the Breidert Air-X-Hauster



Do not use plain round bases on 12" type B or larger ventilators. The square to round base "FR4," shown is more efficient, stronger, and neater looking.

## Approximate Net Weights

M	P	DD	EEE	JJ	JJJ	AREA NECK SQ. IN.	AREA NECK SQ. FT.	CIRC. NECK IN.	GA. METAL	TYPE A	TYPE B	TYPE B2	TYPE FR4 BASE
18"	3"	11	29	18	14	12.5	.087	12.5	26				3
						19.6	.139	15.7	26				4
						28.3	.196	18.8	26				6
						38.5	.267	22.0	26				8
						50.3	.350	25.1	24	18	11	13	
						63.6	.441	28.3	24	22	14	16	
						78.5	.545	31.4	24	28	17	19	
21"	3"	13	34	18	14	113.1	.785	37.7	24	33	23	27	8 1/2
24"	3"	14	38	18	14	153.9	1.07	44.0	24	45	30		10 1/2
27"	3"	16	43	20	14	201.1	1.40	50.3	24	57	40		13
30"	3"	17	47	20	14	254.5	1.77	56.5	24	68	50		15
33"	3"	20	56	22	20	314.2	2.18	62.8	22	98	73		21
36"	3"					380.1	2.64	69.1	22	118	90		24
39"	3"					452.4	3.14	75.4	22	140	107		27
42"	3"					530.9	3.69	81.7	22	160	125		31
45"	4"	26	71	28	20	615.7	4.27	88.0	22	185	145		34
48"	4"	30	84	28	22	706.9	4.91	94.2	20	250	190		52
54"	4"	35	98	30	22	1017.9	7.07	113.1	20	365	280		75
63"	4"	39	111	30	24	1385.4	9.62	132.0	20	525	385		130
72"	4"					1809.6	12.57	150.8	20-18	835	650		160

## THE BREIDERT AIR-X-HAUSTER

### Performance Tables

#### TYPES MFS & MC

Vent. Size	Fan Size	Fan RPM	Motor HP	.0"	Static Pressure CFM Capacity			
					.1"	.125"	.2"	.25"
12"	12"	*1140	*1/20	1000	865	827	695	575
		1725	1/8	1485	1395	1370	1300	1250
14"	14"	*11.40	*1/20	1290	....	....	....	....
		1140	1/12	1290	1130	1085	960	865
		1725	1/4	1930	1840	1790	1710	1655
16"	16"	*1140	*1/12	1770	....	....	....	....
		1140	1/8	1770	1655	1625	1510	1415
		1725	1/3	2660	2575	2555	2480	2430
18"	18"	*1140	*1/6	2340	2140	2080	1900	....
		1725	1/2	3560	3440	3410	3310	3240
20"	20"	*1140	*1/4	2690	2400	2350	2225	2150
24"	24"	*1140	*1/3	4490	4280	4220	4040	....
		1140	1/2	4490	4280	4220	4040	3870
30"	30"	* 750	*1/2	7450	6770	6575	....	....
		720	1/2	7150	6500	6325	5535	4885
		825	3/4	8200	7450	7260	6350	5620
36"	36"	* 600	*3/4	10000	7750	7460	....	....
		565	3/4	9400	7450	6915	4300	2655
		635	1	10600	8350	7910	6550	5880
42"	42"	* 575	*1	13000	9750	9000	6950	5700
		660	1-1/2	14915	12250	11550	9850	8745
48"	48"	* 550	*1-1/2	16500	13250	12650	11125	10340
		640	2	19200	16500	15900	14250	13475

\*Standard motor H.P. and speeds.

For capacities at static pressures not listed refer to factory for special combinations of fan blades and motors.

Do not attempt to use Breidert Type MFS or MC Air-X-Hausters for static pressures higher than  $\frac{1}{4}$ ". Propeller-

type fans are not adapted to the higher pressures, as too great a strain is placed on the fan blades causing excessive vibration. The efficiency is also low. For such installations, use blowers.

## THE BREIDERT AIR-X-HAUSTER

The capacity of Breidert Air-X-Hausters, as determined by air velocity through neck of ventilator, is governed by three factors: wind velocity across head of ventilator, height ventilator is mounted above air intake to room, and difference in temperature between interior and exterior of room.

Many tests have proved that the Breidert Air-X-Hauster has the very high ratio of 1 to 2 for relative velocity of air exhausted through ventilator to velocity of outside wind. This velocity through the ventilator is due to the suction action of wind blowing across ventilator head. The chart at bottom right shows this relationship.

To this velocity must be added the stack action caused by mounting height and temperature difference. The table at top right gives this added velocity for various heights and temperature differences. The capacity in cubic feet per minute (CFM) of any size ventilator can then be determined from the sum of these velocities multiplied by the area of the ventilator neck in square feet . . . See table page 13.

**Example:** A 5-mile wind produces a velocity through the ventilator of 220 feet per minute. With a ventilator mounted 15 feet above the floor, and a temperature difference of  $20^{\circ}$  between inside and outside air, there is an added velocity of 188 feet per minute due to the stack action. Thus the total velocity through the ventilator under these conditions is 408 feet per minute. A 12-inch ventilator has .785 square feet neck area; 408 feet per minute velocity multiplied by .785 square feet area gives 320 CFM. A 12-inch ventilator under these con-

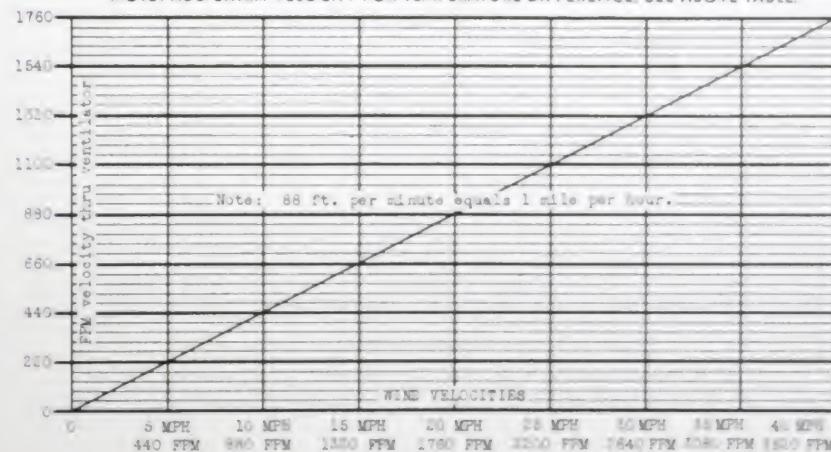
### Capacity and Performance Tables

FLOW OF AIR IN FLUES BY NATURAL DRAFT IN CUBIC FEET PER MINUTE  
AREA ONE SQUARE FOOT

DIFFERENCE IN TEMP. FAHR.	HEIGHT OF FLUE IN FEET SAME AS HEIGHT OF ROOM OR BUILDING								
	10	15	20	30	40	50	60	80	100
10	108	133	153	188	217	242	264	308	342
15	133	162	188	230	265	297	325	375	420
20	153	188	217	265	306	342	373	435	485
25	171	210	242	297	342	383	427	485	530
30	188	230	265	325	375	419	471	530	594
40	216	265	305	374	431	482	529	608	680
50	242	297	342	419	484	541	604	680	768
60	266	327	376	460	532	595	650	747	842

### BREIDERT AIR-X-HAUSTER CAPACITY CHART

FEET VELOCITIES THRU VENTILATOR COMPARED WITH WIND VELOCITIES.  
NOTE: ADD EXTRA VELOCITY FOR TEMPERATURE DIFFERENCE. SEE ABOVE TABLE.



ditions therefore has a capacity of 320 CFM. Capacities for any size and for any given conditions can be similarly determined. Tables on pages 18, 19 and 20 give capacities on this basis for different ventilator sizes with various combinations of wind velocity, mounting height and temperature differences.

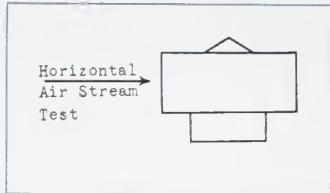
## THE BREIDERT AIR-X-HAUSTER

### Rigid Tests Prove Efficiency of Breidert Air-X-Hausters

Ventilating standards fifty years old or more are entirely inadequate for modern needs. Breidert Air-X-Hausters are designed to meet entirely *new* standards—the highest yet set up for natural draft ventilators. The methods used in testing the efficiency of the Breidert Air-X-Hauster under all wind conditions were probably the most severe ever devised and applied to a ventilator.

#### THE OLD METHOD

Under old testing methods, ventilators are required to show results only with the wind blowing on a horizontal plane. Such tests cannot reveal true performance under actual operating conditions. Actually, variable wind conditions generally prevail which cause air currents to strike at various angles. In addition, obstructions change the course of the wind, causing it to become turbulent and to strike at many angles simultaneously. With some ventilators, wind striking at angles other than horizontal causes severe down-drafts or stagnation.

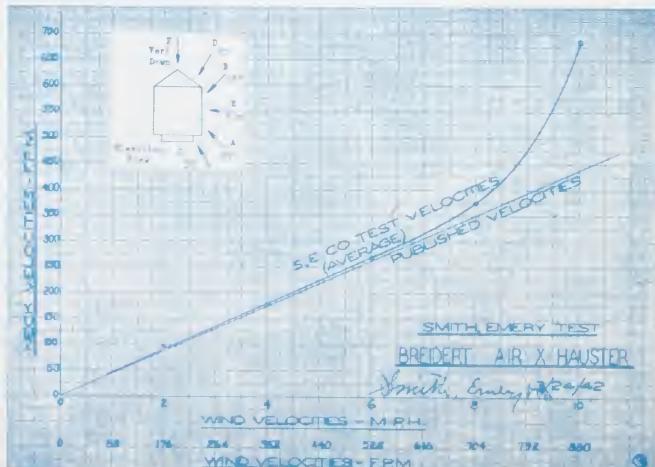
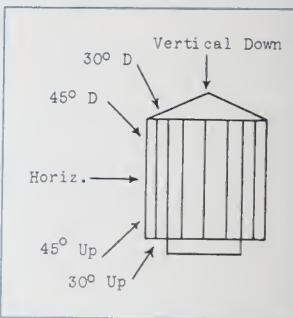


These tests, made in the San Francisco laboratories of Smith, Emery & Co., Pacific Coast branch of the Pittsburgh Testing Laboratories, involved the use of a wind tunnel similar to those used in testing airplanes (see photographs below).

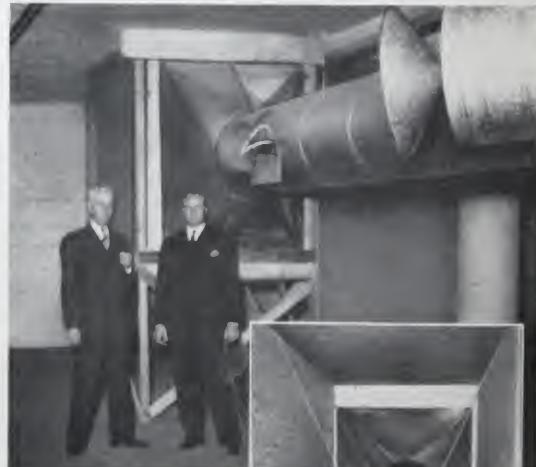
Equally severe tests have been made by other recognized, highly official authorities, with similar results.

#### THE BREIDERT METHOD

The certified ratings of Breidert Air-X-Hausters are based on more than 1200 anemometer readings taken with wind pressure directed at the various angles indicated at right. *Only such testing methods can absolutely assure the scientific, positive performance of a ventilator under true wind conditions.*



Results of the Smith, Emery tests are shown on this chart. Note that test velocities, indicated by top curve, are higher than velocities claimed by the manufacturer. Note also that a wind velocity of 8 miles per hour is the critical point at which the corresponding efficiency curve of the Breidert Air-X-Hauster begins to rise sharply, due to increasing wind pressure becoming equalized all around the ventilator. With many other types of ventilators increased wind velocity means lessened efficiency.



These photographs show the wind tunnel used in testing the Breidert Air-X-Hauster by Smith, Emery & Co. Inset shows ventilator in position in tunnel, ready for testing.

**SMITH, EMERY & COMPANY**  
ESTABLISHED 1904

ENGINEERS - CHEMISTS  
651 HOWARD STREET  
SAN FRANCISCO

SE. NO. 165597

March 24, 1942

Test of 16" Type B,  
Breidert Air-X-Hauster

The G. C. Breidert Co.,  
#3228 S. Central Ave.,  
Los Angeles, Calif.

---- O ----  
R E P O R T

Gentlemen:

In accordance with instructions our Mr. E.I.Rodgers has conducted tests on a 16" Type B Breidert Air-X-Hauster ventilator at 2, 4, 6, 8 and 10 miles per hour wind velocities. Tests were made between March 17 - 23 inclusive.

A 5-H.P. blower fan was used in connection with a specially constructed test tunnel to produce 2 to 10 mile velocities. No attempt was made to straighten the air stream or remove turbulence.

The ventilator was mounted on a 16" neck and anemometer readings were taken at the inlet. The anemometer was recently calibrated. No tests were made with stack or with temperature differential. The air struck the ventilator from certain angles:

- a: Upward " " " 45° " "
- b: Downward " " " 30° " "
- c: Upward " " " 30° " "
- d: Downward " " " 30° " "
- e: Horizontally, the ventilator vertical
- f: The air striking squarely on top of the ventilator cone.

There was an absence of downdraft. And at no time was there a suggestion of stagnation in the throat of the ventilator, or the inlet piece in which the readings were taken.

The following velocities were observed:

MPH	a	b	c	d	e	f
2	100	97	92	102	97	100
4	169	161	185	175	176	188
6	255	261	280	291	268	256
8	370	396	360	371	380	370
10	698	649	589	607	720	863

Respectfully submitted,  
*Smith, Emery Co.*  
INSPECTING & TESTING ENGINEERS

Report of Smith, Emery & Co. certifying the velocities and performance of Breidert Air-X-Hausters, and stating conditions of tests. Note paragraph regarding the absence of down-draft or stagnation.

## 8" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — .350 Sq. Feet

Wind Height Vel. Above MPH	Temperature Difference Between In and Out Doors									
	10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM	10 ft.	15 ft.
10 ft.	100	108	115	121	127	138	146	154	155	155
15 "	108	118	127	135	142	154	166	175	184	198
20 "	115	127	138	146	154	169	181	192	214	228
25 "	121	135	146	156	166	181	196	209	221	240
30 "	127	142	154	165	175	193	208	223	240	258
40 "	137	154	168	180	192	212	230	247	263	299
50 "	146	166	181	195	208	231	251	270	300	325
60 "	155	176	193	208	223	248	270	289	311	348
10 ft.	115	124	131	137	143	153	162	169	179	198
15 "	124	134	143	150	158	170	181	191	208	245
20 "	131	143	153	161	170	184	197	207	222	264
25 "	137	151	162	171	181	197	211	224	240	282
30 "	143	158	170	180	191	208	224	238	256	306
40 "	153	170	184	196	208	228	246	263	286	329
50 "	162	181	197	210	234	246	266	285	305	355
60 "	170	191	209	223	238	263	285	305	324	383
10 ft.	130	139	146	152	158	168	177	185	196	206
15 "	139	149	158	166	173	185	196	206	217	232
20 "	146	158	177	185	191	200	212	223	238	254
25 "	152	166	177	187	196	212	226	239	251	273
30 "	158	173	185	196	206	224	239	254	271	295
40 "	168	189	197	211	223	243	261	278	294	317
50 "	177	196	212	225	238	261	281	300	314	348
60 "	186	207	224	239	253	279	301	320	331	364
10 ft.	161	170	171	183	189	190	208	216	227	237
15 "	170	180	189	196	204	216	227	237	246	269
20 "	177	189	199	208	216	230	243	254	262	288
25 "	183	197	208	218	227	244	256	271	281	311
30 "	189	204	216	226	237	254	270	285	297	330
40 "	190	216	230	242	254	274	292	309	318	353
50 "	208	227	243	256	269	292	312	330	345	384
60 "	216	236	255	270	284	309	331	351	365	410
10 ft.	192	200	208	214	220	230	239	246	257	268
15 "	200	211	220	227	235	247	256	268	277	294
20 "	208	220	230	238	246	260	273	283	294	316
25 "	214	227	239	248	258	274	288	301	313	344
30 "	220	234	247	257	268	285	301	315	327	359
40 "	230	247	261	273	285	305	323	340	352	384
50 "	239	258	274	287	300	315	330	345	356	388
60 "	247	268	286	300	315	340	362	381	395	424
10 ft.	223	231	238	244	251	261	269	277	286	294
15 "	231	241	251	258	265	277	289	298	306	324
20 "	238	251	261	269	277	292	305	315	325	346
25 "	245	258	270	279	288	304	316	332	345	374
30 "	251	265	277	288	298	316	331	346	359	387
40 "	260	277	291	303	316	336	353	370	384	412
50 "	270	282	304	318	331	354	373	392	406	434
60 "	277	300	316	331	346	371	393	412	433	462

## 10" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — .545 Sq. Feet

Wind Height Vel. Above MPH	Temperature Difference Between In and Out Doors									
	10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM	10 ft.	15 ft.
10 ft.	155	168	184	198	210	221	234	240	252	273
15 "	168	180	198	214	222	234	246	252	264	297
20 "	179	198	214	222	234	246	257	263	274	299
25 "	189	201	210	228	243	258	273	287	305	325
30 "	198	211	220	240	257	273	293	300	324	348
40 "	214	240	262	281	300	311	331	359	384	420
50 "	228	258	282	303	324	342	360	391	420	450
60 "	241	274	301	324	347	374	396	420	450	480
10 ft.	179	192	203	213	222	238	252	264	282	297
15 "	192	208	222	234	246	264	284	298	306	323
20 "	203	227	246	262	278	298	311	330	347	364
25 "	213	237	258	276	291	306	324	349	373	395
30 "	222	245	264	281	297	314	332	351	371	395
40 "	232	252	272	291	306	327	346	374	397	422
50 "	252	276	297	317	336	355	377	396	415	444
60 "	265	285	305	325	345	365	384	404	424	454
10 ft.	203	216	236	252	266	284	302	320	336	368
15 "	216	234	250	268	284	302	320	336	354	386
20 "	227	247	266	284	302	320	338	356	374	404
25 "	237	258	276	294	312	330	348	366	384	412
30 "	245	265	284	302	320	338	356	374	392	420
40 "	254	274	293	311	329	347	365	384	402	430
50 "	274	294	313	331	350	368	386	405	423	451
60 "	284	303	321	339	358	376	394	413	432	460
10 ft.	299	312	323	333	343	353	363	372	382	394
15 "	312	328	342	354	365	376	386	396	407	426
20 "	325	342	358	374	386	396	406	414	424	443
25 "	335	354	374	391	402	413	424	434	442	463
30 "	343	362	381	398	411	424	436	446	454	474
40 "	353	372	391	408	421	434	446	456	464	484
50 "	363	382	401	418	431	444	456	466	474	494
60 "	373	392	411	428	441	454	466	476	484	504
10 ft.	347	360	371	384	397	408	419	430	440	460
15 "	360	376	390	404	416	428	439	450	461	480
20 "	371	387	401	416	429	441	454	466	474	494
25 "	381	396	411	426	441	454	467	479	487	506
30 "	391	406	416	431	446	459	471	483	491	510
40 "	401	416	426	441	456	469	481	493	504	524
50 "	411	426	436	451	466	479	491	502	513	534
60 "	421	436	446	461	476	489	501	512	523	544
10 ft.	344	359	374	389	404	419	434	448	461	470
15 "	359	374	389	404	419	434	448	461	474	484
20 "	374	389	404	419	434	449	461	474	484	494
25 "	384	400	415	430	445	460	475	489	501	514
30 "	394	410	425	440	455	470	485	500	515	528
40 "	404	420	435	450	465	480	495	510	520	535
50 "	414	430	445	460	475	490	505	520	535	550
60 "	424	440	455	470	485	500	515	530	545	560
10 ft.	355	370	386	401	416	431	446	461	476	491
15 "	370	386	401	416	431	446	461	476	491	506
20 "	386	401	416	431	446	461	476	491	506	521
25 "	396	411	426	441	456	471	486	501	516	531
30 "	406	421	436	451	466	481	496	511	526	541
40 "	416	431	446	461	476	491	506	521	536	551
50 "	426	441	456	471	486	501	516	531	546	561
60 "	436	451	466	481	496	511	526	541	556	571
10 ft.	366	381	396	411	426	441	456	471	486	501
15 "	381	396	411	426	441	456	471	486	501	516
20 "	396	411	426	441	456	471	486	501	516	531
25 "	406	421	436	451	466	481	496	511	526	541
30 "	416	431	446	461	476	491	506	521	536	551
40 "	426	441	456	471	486	501	516	531	546	561

**16" Breidert Air-X-Hauster**

Capacity — Cubic Feet Per Minute • Neck Area — 1.40 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors											
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM	10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM
4	10 ft.	397	432	460	484	509	550	585	616	503	547	583	613
	15 "	432	473	509	539	568	617	662	701	547	599	645	682
	20 "	460	509	550	583	617	674	725	768	583	645	696	740
	25 "	485	540	585	623	662	725	782	834	615	681	740	779
	30 "	503	545	617	659	701	771	833	891	615	681	740	797
	40 "	518	617	673	721	770	849	921	987	615	719	781	838
	50 "	585	662	725	778	833	924	1003	1078	615	740	817	887
	60 "	618	704	772	831	890	921	1079	1156	783	891	978	1052
	10 ft.	459	494	522	546	571	612	647	678	624	660	690	722
	15 "	494	535	571	601	630	679	724	763	624	666	709	738
5	20 "	522	571	612	645	679	736	787	830	660	722	773	816
	25 "	547	602	647	685	724	787	844	896	692	740	808	858
	30 "	571	647	679	721	763	833	895	953	761	817	865	915
	40 "	610	679	735	783	832	911	983	1046	812	874	936	993
	50 "	647	724	787	840	895	986	1065	1140	849	905	964	1049
	60 "	680	766	834	893	952	1053	1141	1218	895	954	1021	1127
	10 ft.	521	556	584	608	633	674	709	740	952	1053	1141	1218
	15 "	556	597	633	663	692	741	786	825	957	1053	1141	1218
	20 "	584	633	674	707	741	798	849	892	957	1053	1141	1218
	25 "	609	664	709	747	786	849	906	958	971	1053	1141	1218
6	30 "	633	709	741	783	825	895	957	1015	1065	1141	1218	1283
	40 "	672	741	797	845	894	973	1045	1111	1065	1141	1218	1283
	50 "	709	786	849	902	957	1048	1127	1202	1065	1141	1218	1283
	60 "	742	828	896	955	1014	1115	1203	1280	1065	1141	1218	1283
	10 ft.	644	679	707	731	756	797	832	863	1065	1141	1218	1283
	15 "	679	720	756	785	815	864	909	948	1065	1141	1218	1283
	20 "	707	756	797	830	864	901	947	987	1065	1141	1218	1283
	25 "	732	787	832	870	909	972	1029	1081	1065	1141	1218	1283
	30 "	755	815	864	906	948	1018	1080	1136	1065	1141	1218	1283
	40 "	795	864	920	968	1017	1096	1168	1234	1065	1141	1218	1283
7	50 "	832	892	952	1025	1080	1171	1250	1326	1065	1141	1218	1283
	60 "	865	951	1019	1078	1137	1238	1326	1403	1065	1141	1218	1283
	10 ft.	767	802	830	854	879	920	955	985	1065	1141	1218	1283
	15 "	802	843	879	909	938	987	1032	1071	1065	1141	1218	1283
	20 "	830	879	920	953	987	1044	1095	1136	1065	1141	1218	1283
	25 "	855	910	955	993	1032	1095	1152	1204	1065	1141	1218	1283
	30 "	879	955	987	1029	1071	1141	1203	1261	1065	1141	1218	1283
	40 "	918	987	1043	1091	1149	1219	1291	1357	1065	1141	1218	1283
	50 "	955	1032	1095	1148	1203	1294	1373	1442	1065	1141	1218	1283
	60 "	988	1074	1142	1201	1250	1361	1449	1526	1065	1141	1218	1283
8	10 ft.	890	925	953	977	1002	1043	1078	1109	1065	1141	1218	1283
	15 "	925	966	1002	1032	1061	1110	1155	1194	1065	1141	1218	1283
	20 "	953	1002	1043	1076	1110	1167	1218	1261	1065	1141	1218	1283
	25 "	978	1033	1078	1116	1155	1218	1275	1327	1065	1141	1218	1283
	30 "	1002	1078	1110	1152	1194	1264	1326	1384	1065	1141	1218	1283
	40 "	1041	1110	1166	1214	1263	1343	1414	1480	1065	1141	1218	1283
	50 "	1078	1155	1218	1271	1326	1417	1496	1571	1065	1141	1218	1283
	60 "	1111	1197	1265	1324	1383	1484	1572	1643	1065	1141	1218	1283

**18" Breidert Air-X-Hauster**

Capacity — Cubic Feet Per Minute • Neck Area — 1.77 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors											
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM	10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM
4	10 ft.	503	547	583	613	645	674	709	739	503	547	583	613
	15 "	547	599	645	682	719	751	781	811	547	599	645	682
	20 "	583	645	696	739	771	811	841	871	583	645	696	739
	25 "	615	681	740	788	838	871	917	957	615	681	740	788
	30 "	615	691	752	812	871	921	974	1017	615	691	752	812
	40 "	649	781	852	912	974	1037	1097	1155	649	781	852	912
	50 "	740	838	917	985	1054	1126	1194	1263	740	838	917	985
	60 "	783	891	978	1052	1126	1194	1263	1331	783	891	978	1052
	10 ft.	580	624	660	690	722	753	781	811	580	624	660	690
	15 "	624	676	722	759	796	838	874	914	624	676	722	759
5	20 "	660	722	773	816	858	914	964	1047	660	722	773	816
	25 "	692	761	817	865	915	964	1017	1097	692	761	817	865
	30 "	722	796	858	911	964	1021	1072	1149	722	796	858	911
	40 "	771	858	929	989	1047	1107	1167	1238	771	858	929	989
	50 "	817	901	974	1047	1117	1187	1257	1328	817	901	974	1047
	60 "	860	958	1038	1117	1197	1277	1357	1437	860	958	1038	1117
	10 ft.	584	632	680	728	776	824	874	924	584	632	680	728
	15 "	632	680	728	776	824	874	924	974	632	680	728	776
	20 "	674	722	770	818	866	914	962	1014	674	722	770	818
	25 "	714	762	810	858	906	954	1002	1050	714	762	810	858
6	30 "	754	802	850	898	946	994	1042	1090	754	802	850	898
	40 "	794	842	890	938	986	1034	1082	1130	794	842	890	938
	50 "	834	882	930	978	1026	1074	1122	1170	834	882	930	978
	60 "	874	922	970	1018	1066	1114	1162	1210	874	922	970	1018
	10 ft.	814	862	910	958	1006	1054	1102	1150	814	862	910	958
	15 "	854	902	950	998	1046	1094	1142	1190	854	902	950	998
	20 "	894	942	990	1038	1086	1134	1182	1230	894	942	990	1038
	25 "	934	982	1030	1078	1126	1174	1222	1270	934	982	1030	1078
	30 "	974	1022	1070	1118	1166	1214	1262	1310	974	1022	1070	1118
	40 "	1014	1062	1110	1158	1206	1254	1302	1350	1014	1062	1110	1158
7	50 "	1054	1102	1150	1198	1246	1294	1342	1390	1054	1102	1150	1198
	60 "	1094	11										

### 30" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 4.91 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors											
		10 deg. Cap. CFM	15 deg. Cap. CFM	20 deg. Cap. CFM	25 deg. Cap. CFM	30 deg. Cap. CFM	40 deg. Cap. CFM	50 deg. Cap. CFM	60 deg. Cap. CFM	10 deg. Cap. CFM	15 deg. Cap. CFM	20 deg. Cap. CFM	25 deg. Cap. CFM
4	10 ft.	1397	1520	1119	1702	1791	1934	2057	2165	2011	2188	2329	2450
	15 "	1520	1663	1791	1894	1998	2179	2327	2465	2188	2393	2577	2577
	20 "	1619	1791	1934	2052	2170	2372	2549	2701	2329	2577	2782	3122
	25 "	1707	1899	2057	2189	2327	2540	2750	2932	2457	2733	2959	3149
	30 "	1791	1998	2170	2317	2465	2711	2927	3134	2577	3122	3335	3567
	40 "	1921	2170	2367	2514	2706	2887	3237	3469	2757	3122	3405	3901
	50 "	2057	2327	2519	2736	2927	3247	3528	3788	2757	3295	3646	4213
	60 "	2175	2675	2716	2923	3129	3483	3793	4064	2959	3349	3667	4510
	10 ft.	1613	1736	1835	1918	2061	2150	2273	2381	2011	2232	2500	2641
	15 "	1736	1879	2007	2110	2214	2386	2543	2681	2188	2500	2889	3186
5	20 "	1835	2007	2150	2268	2386	2582	2765	2917	2329	2577	2952	3122
	25 "	1923	2115	2273	2405	2543	2765	2966	3148	2457	2733	2959	3349
	30 "	2007	2214	2386	2533	2681	2927	3143	3350	2577	3122	3335	3667
	40 "	2145	2366	2563	2750	2922	3203	3453	3685	2757	3122	3405	4213
	50 "	2273	2519	2765	2952	3143	3463	3744	4004	2959	3349	3667	4510
	60 "	2391	2691	2932	3139	3345	3699	4009	4280	3129	3561	3908	4503
	10 ft.	1830	1953	2052	2135	2224	2367	2490	2598	2011	2232	2500	2641
	15 "	1953	2096	2224	2327	2431	2603	2760	2898	2188	2500	2889	3186
	20 "	2052	2224	2367	2485	2603	2805	2982	3134	2329	2577	2952	3122
	25 "	2140	2332	2490	2622	2760	2982	3181	3365	2457	2733	2959	3349
6	30 "	2224	2431	2603	2750	2898	3144	3360	3567	2577	3122	3335	3667
	40 "	2362	2603	2800	2967	3139	3420	3670	3902	2757	3122	3335	3667
	50 "	2490	2760	2982	3169	3360	3680	3961	4221	3129	3441	3873	4205
	60 "	2608	2908	3149	3356	3562	3916	4226	4497	3129	3434	3823	4205
	10 ft.	2263	2386	2485	2568	2651	2800	2923	3031	2011	2232	2500	2641
	15 "	2386	2529	2657	2760	2864	3036	3193	3331	2188	2500	2889	3186
	20 "	2485	2655	2800	2918	3036	3238	3415	3567	2329	2577	2952	3122
	25 "	2573	2765	2923	3055	3193	3415	3616	3798	2577	3122	3335	3667
	30 "	2657	2864	3036	3183	3333	3577	3793	4000	2757	3122	3335	3667
	40 "	2795	3036	3233	3400	3572	3853	4103	4335	3129	3434	3873	4205
8	50 "	2923	3193	3415	3602	3793	4113	4394	4654	3129	3434	3873	4205
	60 "	3041	3341	3562	3789	3995	4149	4593	4930	3129	3434	3873	4205
	10 ft.	2696	2819	2918	3000	3090	3233	3366	3464	2011	2232	2500	2641
	15 "	2819	2962	3090	3193	3297	3469	3626	3764	2188	2500	2889	3186
	20 "	2918	3090	3233	3351	3469	3746	3971	4100	2329	2577	2952	3122
	25 "	3006	3198	3356	3488	3626	3848	4049	4231	2577	3122	3335	3667
	30 "	3090	3207	3469	3616	3764	4010	4226	4473	3129	3434	3873	4205
	40 "	3228	3469	3766	3833	4005	4286	4515	4768	3129	3434	3873	4205
	50 "	3356	3626	3848	4035	4226	4546	4821	5087	3129	3434	3873	4205
	60 "	3474	3774	4015	4222	4428	4782	5052	5363	3129	3434	3873	4205
10	10 ft.	3129	3252	3351	3434	3523	3666	3789	3897	2011	2232	2500	2641
	15 "	3252	3395	3523	3626	3730	3902	4159	4497	2188	2500	2889	3186
	20 "	3351	3523	3666	3784	3902	4104	4281	4433	2329	2577	2952	3122
	25 "	3439	3631	3789	3921	4059	4281	4482	4664	2577	3122	3335	3667
	30 "	3523	3730	3902	4049	4197	4443	4659	4866	3129	3434	3873	4205
	40 "	3661	3902	4099	4266	4438	4719	4969	5201	3129	3434	3873	4205
	50 "	3789	4059	4281	4468	4659	4879	5260	5520	3129	3434	3873	4205
	60 "	3907	4207	4448	4655	4861	5215	5525	5796	3129	3434	3873	4205

### 36" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 7.07 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors											
		10 deg. Cap. CFM	15 deg. Cap. CFM	20 deg. Cap. CFM	25 deg. Cap. CFM	30 deg. Cap. CFM	40 deg. Cap. CFM	50 deg. Cap. CFM	60 deg. Cap. CFM	10 deg. Cap. CFM	15 deg. Cap. CFM	20 deg. Cap. CFM	25 deg. Cap. CFM
4	10 ft.	2011	2188	2329	2450	2577	2726	2859	3094	2011	2232	2500	2641
	15 "	2188	2393	2577	2726	2952	3122	3349	3547	2188	2500	2889	3186
	20 "	2329	2577	2892	3045	3271	3434	3745	3972	2329	2577	2952	3122
	25 "	2450	2733	2959	3271	3463	3745	3979	4170	2457	2733	3020	3411
	30 "	2577	3122	3335	3535	3774	3972	4290	4517	2577	3122	3335	3667
	40 "	2726	3271	3463	3745	4026	4292	4517	4771	2726	3271	3463	3745
	50 "	2859	3434	3745	4045	4361	4656	4959	5246	2859	3434	3745	4045
	60 "	3094	3745	4045	4361	4656	4959	5246	5536	3094	3745	4045	4361
	10 ft.	2634	2811	2952	3073	3200	3349	3497	3745	2634	2811	2952	3138
	15 "	2811	3016	3200	3405	3575	3745	3972	4170	2811	3016	3200	3405
5	20 "	2952	3200	3405	3575	3745	3972	4170	4368	2952	3200	3405	3667
	25 "	3080	3355	3582	3774	3972	4170	4368	4563	3080	3355	3582	3844
	30 "	3200	3497	3774	4026	4205	4437	4631	4843	3200	3497	3774	4026
	40 "	3320	3745	4026	4282	4536	4747	4942	5145	3320	3745	4026	4282
	50 "	3440	3874	4120	4421	4743	4999	5200	5416	3440	3874	4120	4421
	60 "	3562	4075	4375	4687	4987	5274	5536	5822	3562	4075	4375	4687
	10 ft.	3880	4057	4198	4319	4446	4651	4828	5069	3880	4057	4198	4446
	15 "	4057	4446	4651	4848	5069	5274	5536	5822	4057	4446	4651	4848
	20 "	4198	4446	4651	4848	5069	5274	5536	5822	4198	4446	4651	4848
	25 "	4321	4622	4826	5020	5218	5422	5622	5822	4321	4622	4826	5020
6	30 "	4446	4743	4949	5151	5353	5553	5753	5953	4446	4743	4949	5151
	40 "	4644	4941	5149	5346	5543	5743	5943	6140	4644	4941	5149	5346
	50 "	4767	5064	5361	5658	5955	6152	6352	6552	4767	5064	5361	5658
	60 "	4886	5274	5571	5868	6165	6462	6762	6962	4886	5274	5571	5868
	10 ft.	4982	5233	5562	5836	6138	6439	6739	7040	4982	5233	5562	5836
	15 "	5233	5562	5836	6138	6439	6739	7040	7341	5233	5562	5836	6138
	20 "	5409	5717	6015	6313	6610	6909	7208	7509	5409	5717	6015	6313
	25 "	5627	5934	6232	6530	6828	7126	7424	77				

## WIND VELOCITIES THROUGHOUT THE UNITED STATES.

Here are listed the lowest monthly average wind velocity (LMV), highest monthly average wind velocity (HMV), average yearly wind velocity (AYV), yearly prevailing wind direction (YPD), and the highest recorded wind velocity (HRV), according to U. S. Weather Bureau records.

For most satisfactory results, ventilator capacities should be figured on the basis of lowest monthly average, since in most cases the lowest wind velocities are during the summer when the need is greatest. Proper allowances may be made according to conditions. By referring to pages 18, 19 and 20 the capacities of various size ventilators can be determined according to the wind velocities in each territory.

STATE	CITY	LMV MPH	HMV MPH	AYV MPH	YPD	HRV	STATE	CITY	LMV MPH	HMV MPH	AYV MPH	YPD	HRV
ALABAMA	BIRMINGHAM	4.9 AUG	8.6 MAR	6.7	SOUTH	46	INDIANA	EVANSVILLE	6.4 AUG	10.6 MAR	8.5	SOUTH	60
	MOBILE	6. " 11. "	9.7	9.7	NORTH	87		FT. WAYNE	7.6 "	11. "	9.6	S.W.	51
	MONTGOMERY	5.8 " 8. FEB	6.8	6.8	EAST	41		INDIANAPOLIS	8.5 "	12.1 "	10.5	SOUTH	63
								TERRE HAUTE	7.2 "	11.7 "	9.4	SOUTH	47
ARIZONA	PHOENIX	5.1 DEC	6.4 APR	5.3	WEST	40	IOWA	CHARLES CITY	5.2 AUG	8.7 APR	7.1	N.W.	48
	YUMA	4.7 OCT	6.6 MAR	5.9	NORTH	43		DAVENPORT	7.1 "	10.2 "	8.7	N.W.	56
ARKANSAS	FORT SMITH	5.5 AUG	9.2 MAR	7.2	EAST	57		DES MOINES	6.1 "	9.5 "	7.8	S.W.	50
	LITTLE ROCK	5.7 " 9.4 "	7.4	7.4	SOUTH	49		DUBUQUE	5.8 "	8.1 "	7.	N.W.	47
								KEOKUK	5.7 "	9.1 MAR	7.5	S.W.	49
CALIFORNIA	EUREKA	6.1 OCT	8.3 APR	7.4	NORTH	46		SIOUX CITY	9.9 "	13.2 APR	11.6	N.W.	65
	FRESNO	5.3 NOV	8.7 JUNE	6.9	N.W.	41	KANSAS	CONCORDIA	6.5 AUG	9.8 APR	7.8	SOUTH	60
	LOS ANGELES	5.7 SEP	6.4 FEB	6.1	S.W.	38		DODGE CITY	9.9 "	13.2 "	11.	S.E.	58
	OAKLAND	7.3 NOV	11.8 JULY	9.3	WEST	50		WICHITA	11.1 "	14. MAR	12.1	SOUTH	68
	RED BLUFF	4.5 AUG	6.7 MAR	5.8	S.E.	49	KENTUCKY	LEXINGTON	8.5 AUG	14.1 MAR	11.5	S.W.	56
	SACRAMENTO	6.1 NOV	8.6 JUNE	7.5	SOUTH	65		LOUISVILLE	6.5 "	10.7 "	8.7	S.W.	58
	SAN DIEGO	6.1 " 7.3 APR	6.7	N.W.	43								
	SAN FRANCISCO	7.3 " 11.8 JULY	9.3	WEST	50								
	SAN JOSE	5.9 OCT	7.4 MAY	6.7	N.W.	38							
COLORADO	DENVER	6.6 AUG	8.4 APR	7.4	SOUTH	53	LOUISIANA	NEW ORLEANS	5.8 AUG	8.8 MAR	8.7	S.E.	66
	GRAND JUNCTION	3.8 JAN	6.8 "	5.5	S.E.	—		SHREVEPORT	5.5 "	8.8 "	7.	S.E.	50
	PUEBLO	6. AUG	8.2 "	6.8	N.W.	64							
CONNECTICUT	HARTFORD	6.2 SEPT	8.7 "	7.5	N.W.	58	MAINE	EASTPORT	7.3 AUG	12.5 JAN	9.9	SOUTH	—
	NEW HAVEN	7.1 AUG	10.1 MAR	8.7	NORTH	49		PORTLAND	7.1 "	9.6 MAR	8.6	N.W.	48
DIST. OF COL. WASHINGTON		4.8 AUG	8.5 "	6.4	N.W.	55	MARYLAND	BALTIMORE	6.9 AUG	8.6 MAR	7.6	N.W.	54
FLORIDA	APALACHICOLA	6. JULY	9.3 OCT	7.8	NORTH	59	MASS.	BOSTON	12.2 AUG	16.5 FEB	14.3	WEST	60
	JACKSONVILLE	8.3 AUG	9.8 MAR	9.1	N.E.	58		NANTUCKET	11.6 "	16.3 MAR	14.6	S.W.	66
	KEY WEST	8.3 " 11. NOV	9.9	EAST	84								
	MIAMI	8.1 JUL	10.7 "	9.3 "	"	87	MICHIGAN	ALPENA	9.3 JUN	12.7 MAR	11.5	N.W.	47
	PENSACOLA	9.2 AUG	11. MAR	10.6	N.E.	91		DETROIT	9. AUG	14. "	12.	S.W.	67
	TAMPA	6.7 " 8.6 "	7.8	N.E.	75		ESCANABA	8.2 "	10.1 NOV	9.3	SOUTH	45	
								GRAND HAVEN	8.3 AUG	13.4 "	11.3	WEST	60
	ATLANTA	8.1 AUG	11.9 FEB	10.2	N.W.	51		GRAND RAPID	7.4 "	9.6 "	9.6	WEST	51
	AUGUSTA	5.4 " 7.1 MAR	6.2	N.W.	49		HOUGHTON	7.7 "	9.4 "	8.7	"	63	
	MACON	5.7 " 7.8 "	6.7	N.W.	46		LANSING	4. " 7.8 MAY	6.	S.W.	45		
	SAVANAH	7.4 " 10.3 "	8.8	S.W.	68		LUDINGTON	8.9 JUL	12.6 NOV	10.7	SOUTH	46	
	THOMASVILLE	3.8 " 5.9 "	4.8	S.W.			MARQUETTE	8.4 JUN	11.4 JAN	10.2	N.W.	53	
								SAULT ST. MARIE	6.8 AUG	9.8 MAR	8.5	N.W.	56
IDAHO	BOISE	5.4 OCT	7. APR	6.	N.W.	43	MINNESOTA	DULUTH	9.8 JUL	12.9 APR	12.	N.E.	60
	POCATELLO	7.9 AUG	9.2 MAR	8.8	S.E.	46		MINNEAPOLIS	10. " 12.3 "	11.2	N.W.	65	
								MOORHEAD	8.3 " 10.9 "	9.7	N.W.	58	
ILLINOIS	CAIRO	6. AUG	11.1 MAR	8.5	SOUTH	65		ST. PAUL	7.9 AUG	10.7 "	9.4	S.E.	78
	CHICAGO	10. " 13. "	11.	S.W.	65	MISSISSIPPI	JACKSON	4.9 AUG	8.1 MAR	6.4	S.E.	49	
	PEORIA	5.7 " 9.4 "	7.7	SOUTH	45		MERIDIAN	4.1 "	6.9 "	5.4	S.W.	40	
	SPRINGFIELD	9.4 " 13.8 "	11.6	"	45		VICKSBURG	4.9 "	8.1 "	6.4	S.E.	49	

STATE	CITY	LMV MPH	HMV MPH	AYV MPH	YPD	HRV	STATE	CITY	LMV MPH	HMV MPH	AYV MPH	YPD	HRV		
MISSOURI	COLUMBIA	5.7	AUG 10.2	MAR	8.	SOUTH	50	PENNSYLVANIA	ERIE	9.3	AUG 13.2	JAN	11.4	WEST	55
	HANNIBAL	7.5	" 10.8	"	9.2	S.W.	47		HARRISBURG	5.1	" 8.6	MAR	6.8	WEST	54
	KANSAS CITY	9.	" 14.	"	11.	SOUTH	57		PHILADELPHIA	9.2	" 11.9	"	10.4	N.W.	68
	ST. JOSEPH	7.2	" 10.5	"	8.8	S.E.	51		PITTSBURG	8.6	" 12.	"	10.4	N.W.	56
	ST. LOUIS	8.9	" 12.4	"	10.8	SOUTH	91		READING	5.5	" 8.8	"	6.9	N.W.	70
	SPRINGFIELD	8.3	" 11.9	"	10.2	S.E.	52		SCRANTON	5.5	" 8.2	"	6.9	S.W.	41
MONTANA	HAVRE	7.	AUG 10.	DEC	8.6	S.W.	57	RHODE ISLAND	BLOCK ISLAND	11.9	AUG 18.1	DEC	14.7	S.W.	69
	HELENA	7.2	DEC 8.7	APR	7.9	S.W.	54		PROVIDENCE	9.3	" 13.4	MAR	11.6	N.W.	63
	KALISPELL	5.2	NOV 6.9	"	6.	N.W.	38								
	MILES CITY	5.3	JAN 7.5	"	5.6	SOUTH	47								
NEBRASKA	LINCOLN	9.	AUG 12.1	APR	10.4	SOUTH	62	S. CAROLINA	CHARLESTON	9.2	AUG 11.6	MAR	10.5	S.W.	81
	NORTH PLATTE	8.3	" 10.7	"	8.7	WEST	73		COLUMBIA	5.7	" 10.2	"	8.	SOUTH	50
	OMAHA	7.5	" 10.3	MAR	9.	N.W.	53		GREENVILLE	6.6	" 9.6	"	8.	N.E.	50
	VALENTINE	9.3	JAN 12.8	APR	10.5	N.W.	59	S. DAKOTA	HURON	9.	AUG 12.8	APR	10.8	S.E.	56
NEVADA	RENO	5.8	DEC 8.5	APR	7.	WEST	46		RAPID CITY	6.8	" 10.4	"	7.8	WEST	—
	WINNEMUCCA	6.8	AUG 8.8	"	7.8	S.W.	75		YANKTON	6.2	" 10.4	"	8.2	N.W.	80
NEW HAMP.	CONCORD	5.2	AUG 7.6	APR	6.4	N.W.	40	TENNESSEE	CHATTANOOGA	5.2	AUG 8.4	MAR	6.6	S.W.	64
								KNOXVILLE	5.6	" 7.9	"	6.6	S.W.	59	
								MEMPHIS	7.1	" 10.2	"	8.6	S.W.	58	
								NASHVILLE	7.2	" 11.9	APR	9.1	N.W.	58	
N.JERSEY	ATLANTIC CITY	13.	AUG 16.8	MAR	14.9	N.W.	--	TEXAS	ABILENE	8.2	AUG 11.9	APR	9.9	SOUTH	51
	CAMDEN	9.2	" 11.9	"	10.4	N.W.	68		AMARILLO	10.5	" 14.	"	12.2	"	65
	NEWARK	12.4	" 17.8	"	15.2	N.W.	--		AUSTIN	6.6	SEP 9.4	MAR	7.7	S.E.	44
	SANDY HOOK	11.	JUL 16.	"	14.	N.W.	--		BROWNSVILLE	7.5	" 11.1	"	9.2	S.E.	20
	TRENTON	8.9	AUG 12.4	"	10.6	N.W.	--		CORPUS CHRISTI	10.4	DEC 14.1	APR	11.9	S.E.	72
N.MEXICO	ALBUQUERQUE	6.9	JAN 9.6	APR	7.8	WEST	63		DALLAS	8.4	AUG 12.3	"	10.1	S.E.	63
	ROSWELL	5.7	AUG 9.3	MAR	6.9	SOUTH	64		DEL RIO	7.3	DEC 10.1	"	8.9	S.E.	57
	SANTA FE	6.	8.4	APR	7.1	S.E.	42		EL PASO	8.	SEP 11.6	MAR	9.3	EAST	60
NEW YORK	ALBANY	6.8	AUG 9.2	MAR	8.	SOUTH	59		FT. WORTH	9.2	AUG 11.6	"	10.2	SOUTH	55
	BINGHAMPTON	4.4	" 7.3	"	5.9	N.W.	37		GALVESTON	9.1	" 11.7	APR	10.6	S.E.	71
	BUFFALO	11.7	" 17.7	JAN	14.6	S.W.	73		HOUSTON	8.2	" 11.3	MAR	9.8	S.E.	63
	CANTON	8.2	" 11.4	"	10.1	S.W.	62		PALESTINE	5.7	" 9.2	"	7.2	SOUTH	47
	ITHACA	7.6	" 12.	"	9.9	N.W.	70		PORT ARTHUR	8.	" 10.9	APR	9.5	"	42
	NEW YORK	12.4	" 17.9	MAR	15.2	N.W.	73		SAN ANTONIO	6.9	" 9.1	MAR	7.9	S.E.	56
	OSWEGO	8.	" 12.	JAN	10	SOUTH	49	UTAH	SALT LAKE CITY	6.4	DEC 8.7	APR	7.7	S.E.	53
	ROCHESTER	7.5	" 10.8	FEB	9.2	S.W.	60	VERMONT	BURLINGTON	8.4	JUL 12.8	JAN	10.3	SOUTH	54
	SYRACUSE	8.7	" 13.2	"	11.2	SOUTH	--								
N.CAROLINA	ASHEVILLE	5.4	JUL 10.2	MAR	7.8	N.W.	40	VIRGINIA	CAPE HENRY	10.1	JUL 13.7	MAR	12.3	S.W.	80
	CHARLOTTE	4.5	AUG 7.5	"	5.8	S.W.	45		LYNCHBERG	6.1	AUG 9.2	"	7.5	N.W.	49
	GREENSBORO	6.2	" 9.6	"	7.6	S.W.	49		NORFOLK	10.5	" 14.2	"	12.2	SOUTH	63
	HATFIELD	10.8	" 15.4	"	12.8	S.W.	80		RICHMOND	6.1	" 9.1	"	7.3	S.W.	48
	RALEIGH	5.6	" 8.6	"	7.	S.W.	45	WASHINGTON	NORTH HEAD	11.5	AUG 18.6	DEC	14.8	N.W.	126
	WILMINGTON	6.4	DEC 9.3	"	7.7	S.W.	53		SEATTLE	7.	" 11.9	JAN	9.1	SOUTH	59
N. DAKOTA	BISMARCK	8.3	DEC 10.9	APR	9.1	N.W.	63		SPokane	5.9	OCT 7.4	APR	6.5	S.W.	41
	DEVILS LAKE	9.2	AUG 12.	"	10.6	N.W.	--		TACOMA	5.4	AUG 7.2	MAR	6.3	S.W.	44
	FARGO	8.3	JUL 10.9	"	9.7	N.W.	58		TATONKIA ISLAND	9.9	JUL 21.4	DEC	15.	EAST	110
	WILLISTON	8.3	AUG 10.5	MAY	8.9	WEST	56		WALLA WALLA	4.6	OCT 6.4	MAR	5.5	SOUTH	53
OHIO	CINCINNATI	5.3	AUG 8.8	MAR	7.1	S.W.	54		YAKIMA	4.4	NOV 7.6	MAY	5.9	N.W.	34
	CLEVELAND	10.9	JUL 15.	JAN	13.2	SOUTH	60	W. VIRGINIA	ELKINS	2.6	AUG 5.1	MAR	4.5	WEST	44
	COLUMBUS	8.2	AUG 12.4	MAR	10.4	S.W.	60		PARKERSBURG	5.1	" 8.2	"	6.5	S.E.	--
	DAYTON	7.	" 12.	"	9.6	S.W.	51								
	SANDUSKY	9.7	JUL 13.6	"	11.9	S.W.	56								
	TOLEDO	9.4	AUG 12.5	"	11.2	S.W.	65	WISCONSIN	GREEN BAY	8.7	AUG 11.2	APR	10.1	SOUTH	53
								LA CROSSE	6.	" 8.6	"	7.3	"	60	
OKLAHOMA	OKLAHOMA CITY	9.2	AUG 13.9	MAR	11.5	SOUTH	57		MADISON	7.6	JUL 11.2	MAR	9.7	N.W.	56
								MILWAUKEE	8.7	" 12.2	"	10.9	WEST	49	
OREGON	BAKER	6.6	AUG 7.5	APR	6.9	S.E.	40	WYOMING	CHEYENNE	8.4	AUG 13.8	JAN	11.2	N.W.	63
	PORTLAND	6.1	OCT 7.5	FEB	7.	N.W.	43		LAUDER	3.1	DEC 5.5	APR	4.5	S.W.	74
	ROSEBURG	2.4	" 3.8	APR	3.3	N.W.	40		SHERIDAN	4.5	AUG 7.3	APR	5.4	N.W.	58
									YELLOWSTON PK.	6.8	AUG 8.7	MAR	7.8	SOUTH	--

## ASK FOR THIS DEMONSTRATION OF THE BREIDERT AIR-X-HAUSTER



The revolutionary yet scientific principle of the Breidert Air-X-Hauster is clearly and interestingly shown in this remarkable demonstration. Miniature models are used which accurately reproduce the exact action of the Breidert Air-X-Hauster under actual wind conditions, as compared to the action of ordinary ventilators. This demonstration, performed in your own office, offers conclusive proof of the higher efficiency of the Breidert Air-X-Hauster in providing positive ventilation no matter which way the wind blows and of eliminating back-drafts. Phone or write your nearest Breidert representative.\*

**Suggestion to Architects.** The following paragraph inserted in your specifications will assure you of receiving the finest type of ventilation: "Furnish and install, where shown on plans, Breidert Air-X-Hausters of size and type indicated. Ventilators furnished must be constructed of heavy copper bearing galvanized iron, must have air passages free of obstructing braces or arms, must show an air velocity through the neck in the ratio of at least 1 to 2 compared to the wind velocity over the ventilator head, no matter in which direction the wind blows, and must be absolutely proof against back-drafts."

## G. C. BREIDERT CO.

Manufacturers Breidert Air-X-Hausters, 634 South Spring Street, Los Angeles 14, California

\* Representatives Are Located in Principal Cities Throughout the United States



BREIDERT AIR-X-HAUSTER

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**G. C. BREIDERT CO.**

MANUFACTURER

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634 South Spring St.

Los Angeles 14, Calif